Arthroscopic Treatment of Translunate Perilunate Injuries, Not Dislocated (PLIND)

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Abstract

Background Translunate perilunate dislocations were recently described as well as perilunate injuries, not dislocated (PLIND). The authors present a case of transradial styloid, translunate PLIND which sustained a full arthroscopic reduction and internal fixation.

Case Description A 33-year-old man sustained a transradial styloid, translunate PLIND due to a fall from a truck with his wrist in hyperextension. The diagnosis was made at the acute stage. Full arthroscopic reduction and internal fixation with Kirschner wires was performed, followed by a 6 weeks' immobilization period. Uneventful healing of both the lunate and radial styloid were observed at 6 weeks and confirmed with a computed tomography scan. At 4 years of follow-up, the Lyon wrist score was 78% (good).

Literature Review Very few lunate fractures are described in the literature. Translunate perilunate dislocations were recently described as well as PLIND. To the best of the authors' knowledge, a case of transradial styloid, translunate PLIND which sustained a full arthroscopic reduction and internal fixation has never been reported so far.

Clinical Relevance This case reports a unique pattern of transradial styloid, translunate PLIND and outlines the usefulness of a full arthroscopic treatment. An open reduction for this pattern of injury would have been extensive, difficult, and probably unreliable.

Keywords
- perilunate injuries
- not dislocated
- lunate fracture
- perilunate dislocations
- wrist arthroscopy

Lunate fractures are exceedingly rare, accounting for only 1% of all carpal fractures.[1,2] They may be either isolated or combined with other wrist fractures or fracture dislocations.[3–5] Translunate perilunate dislocations were recently described[3] as well as perilunate injuries, not dislocated (PLIND).[6]

The authors present a case of transradial styloid, translunate PLIND which sustained a full arthroscopic reduction and internal fixation. To the best of the authors' knowledge, a case of transradial styloid, translunate PLIND which sustained a full arthroscopic reduction and internal fixation has never been reported so far.

Case Description

A 33-year-old male truck driver fell off his truck with his left wrist in hyperextension. Examination showed marked wrist swelling. Radiographs (►**Fig. 1**) showed displaced lunate and radial styloid fractures. A computed tomography scan (►**Fig. 2**) was performed. This injury was classified as a transradial styloid, translunate PLIND. The authors thought that a full arthroscopic treatment was more appropriate than open reduction internal fixation (ORIF). Midcarpal arthroscopy showed no significant gaps at the lunotriquetral interval. Radiocarpal arthroscopy showed not lesion of the triangular fibrocartilage complex. A 3 to 4 portal was used for reduction of the lunate fracture (►**Fig. 3**). A 6-R portal was used for viewing while lunate reduction was performed. A 6-U portal was used for Kirschner wire (K-wire) fixation of the lunate (►**Fig. 4**). K-wires were preferred over screws given the peculiar fracture line. Fixation of the radial styloid fracture was done with two K-wires. Intraoperative fluoroscopy was used. Postoperative radiographs confirmed the

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Fig. 1 Preoperative standard PA view showing the displaced fractures of the lunate and radial styloid.

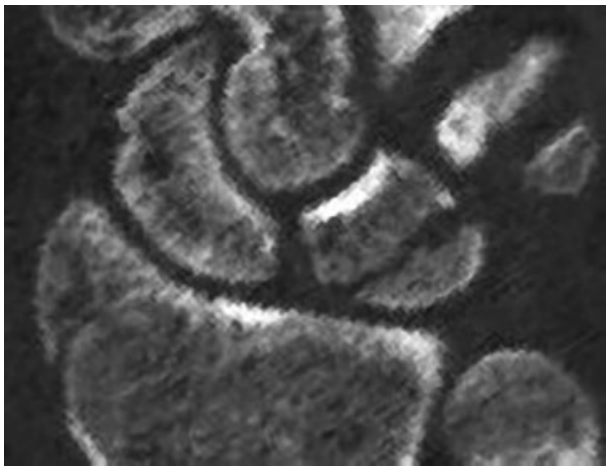

Fig. 2 CT scan coronal slica focusing on the fracture lines shown in ►**Fig. 1**.

reduction of both lunate and radial styloid fractures (►**Figs. 5** and **6**). Postoperative immobilization consisted of 3 weeks in a long-arm cast followed by 4 weeks in a short-arm cast. The K-wires were removed at 7 weeks.

At 44 months' follow-up, Visual Analogue Scale pain was 1/10, QuickDASH was 15/100, and Patient-Rated Wrist Evaluation was 13/100. Pronation was 80 degrees, supination 80 degrees, wrist extension 60 degrees, flexion 50 degrees, and grip strength was 75% of the normal contralateral side. Pronation/supination strength was 90/85% of the normal contralateral side. The full Lyon wrist score was 78% (good). The patient had fully resumed his job. Posterioranterior and lateral radiographs showed anatomical union of both the lunate and radial styloid along with normal carpal alignment (►**Figs. 7** and **8**).

Discussion

The authors presented a case of transradial styloid, translunate PLIND treated with full arthroscopic reduction, and internal fixation and followed up for 4 years.

PLIND were described in 2013 as a "forme fruste" of perilunate dislocations following high energy falls or trauma.[6] This diagnosis was previously unknown as such

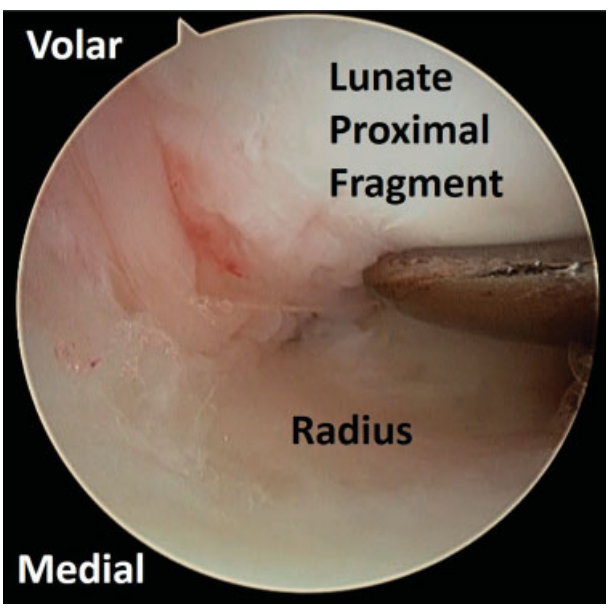

Fig. 3 Radiocarpal arthroscopic view, scope in 6R portal, flat probe in 3-4 portal. The flat probe is reducing the displacement of the proximal lunate fragment.

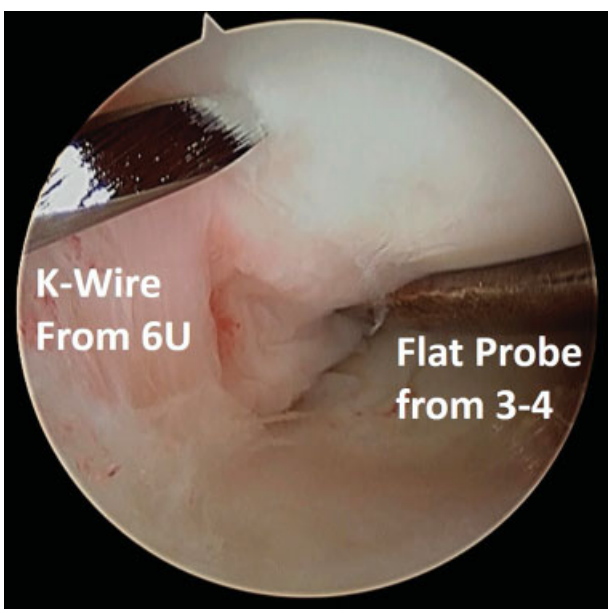

Fig. 4 Same arthroscopic view as in ►**Fig. 3**: while the flat probe is reducing the displacement of the proximal lunate fragment, a 15/10e k-wire is advanced through the reduced lunate fragment.

Fig. 5 Immediate postoperative PA radiograph.

Fig. 6 Immediate postoperative lateral radiograph.

despite the fact that a few papers had alluded to the fact that some perilunate dislocations could exist without true capitolunate dislocation.[7,8] A floating lunate is a lesser arc type of PLIND. PLIND may be missed at the acute stage.[6]

Lunate fractures isolated or combined with other carpal injuries, are exceedingly rare but there are several reports in the literature.[6,9–16] Teisen and Hjarbaek[2] proposed a radiological classification, dividing them into five groups (volar/dorsal pole, transverse, coronal, and chip fractures). Lunate fractures may be missed, particularly at the acute stage.[2] We found only one report of an isolated coronal lunate fracture which was treated using arthroscopy.[17]

Fig. 7 Follow-up PA radiograph (44 months).

Fig. 8 Follow-up lateral radiograph (44 months).

The translunate arc of perilunate dislocations was described by Bain et al in 2008,[3] in addition to the lesser and greater arcs described by Johnson and colleagues in 1980.[18] We described five translunate PLIND in our 2013 PLIND paper.[6] None was treated with arthroscopy. To the best of our knowledge, there is no previous report of a transradial styloid translunate PLIND treated with full arthroscopic surgery.

It is the authors' opinion that arthroscopy, in addition to its diagnostic usefulness, provided a definite advantage over ORIF in the treatment of our patient. An ideal trajectory of the K-wires would have been very difficult and/or invasive to achieve through an ORIF. Regarding the fixation of the injury, the 3 to 4 portal provided an ideal access to precise reduction of the lunate fracture using a flat probe. The 6-U arthroscopic portal provided an ideal trajectory for the K-wire fixation of the lunate fracture. Moreover, arthroscopy offered a theoretical significant advantage over ORIF regarding the risk of lunate avascular necrosis since there was no additional iatrogenic damage to the lunate vascularity. Actually, the lunate achieved an uneventful primary healing in 7 weeks.

Conflict of Interest
None declared.

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